



DC Brushless Motor Driver IC

PT-30DFA

Single- Phase Full-Wave Linear Drive

APPLICATIONS

- Single coils DC brushless motor.
- DC 2.0V~18V.

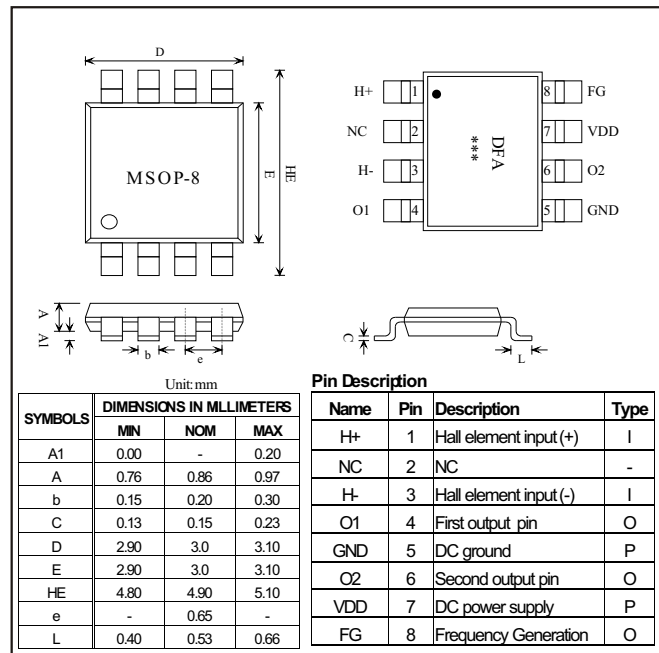
FEATURES

- Single-phase full-wave linear driver (BTL linear output driver)
- Switch noise elimination
- Motor lock protection and automatic restart
- Connectable direct to Hall element
- Built-in hysteresis comparator
- Frequency Generation output
- Low power consumption and high driving efficiency

INPUT DEVICES

- HALL IC or HALL ELEMENT

PACKAGE: MSOP8



SPECIFICATIONS

Absolute Maximum Ratings (Ta = 25C)

Parameter	Symbol	Conditions	Ratings	Units
Maximum supply voltage	V_{DD}^{max}		18	V
Allowable power dissipation	P_d		450*	mW
Operating temperature	T_a		-30 ~ +100	°C
Storage temperature	T_s		-55 ~ +150	°C
Output current	I_{out}	Continue	350	mA

* On 50mm x 50mm x 1.6mm glass epoxy board

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PROLIFIC TECHNOLOGY INC.
7F, No.48, Sec.3, Nan Kang Rd., Nan Kang, Taipei, 115, Taiwan

Electrical Characteristics

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Units
Supply Voltage	V_{DD}		2.0		18	V
Output low-level Voltage	V_{OL}	$I_O=200mA$		0.4	0.5	V
Output High-level Voltage	V_{OH}	$I_O=200mA$	$V_{CC}-0.5$	$V_{CC}-0.4$		V
Output Breakdown Voltage	V_{BV}		18	22	30	V
Input offset voltage	V_{OS}		-6		6	mV
Supply Current	I_{DD}	Output open		3	10	mA
FG flow-in Current	I_{FG}	Pull-high resistor is 470ohm@12V		25		mA
FG Supply Voltage					30	V
FG Frequency		Same with Hall input signal				
Pre-Amplifier Gain	V_G			50		dB

Truth Table

H+	H-	State	O1	O2	FG	RD
H	L	Rotate	L	H	L	L
L	H	Rotate	H	L	H	L
H	L	Lock	L	L	H	H
L	H	Lock	L	L	H	H

Lock Protection

In order to protect the motor, the driver IC will be shutdown to drive the coil when the motor is locked over 0.3seconds. Then, it restarts to drive the motor after 2.1seconds. Figure 1 shows the timing diagram between the hall input signal and driver's output state.

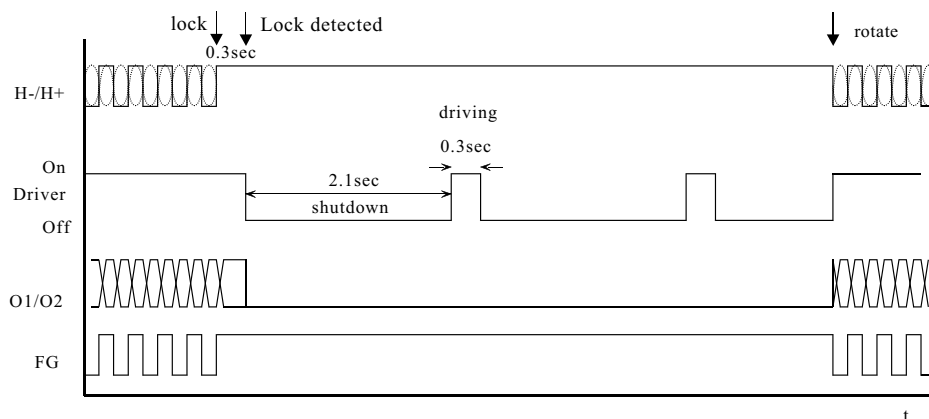


Fig 1. Lock Protection

Pre-Amplifier

This driver IC integrates signal amplifier and the hysteresis comparator in this chip. The hysteresis comparator uses the hysteresis characteristic to eliminate noisy oscillations at output of the comparator.

The driver IC architecture block diagram is shown in Fig. 2.

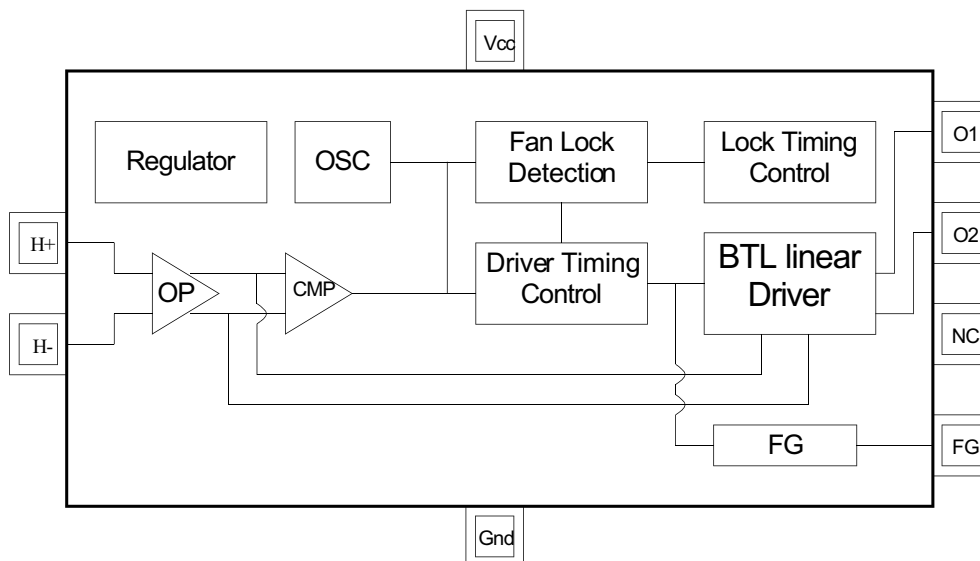


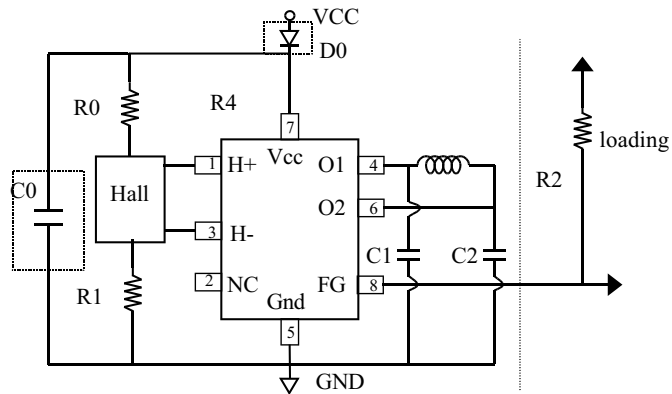
Fig. 2. Driver IC Architecture

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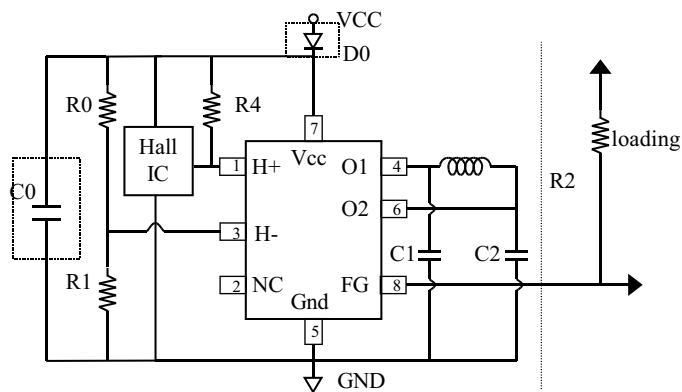
APPLICATION CIRCUITS/ Single coil

★Hall element input



R0=R1: depend on hall device Spec. R0=R1 is recommended
R2: open drain loading
C0: optional decoupling capacitor 0.1uF
C1,C2: 1uF~2.2uF capacitor

★Hall IC input



R0, R1, R4: 10K
R2: open drain loading
C0: optional decoupling capacitor 0.1uF
C1,C2: 1u~2.2uF capacitor